27 Comparative variability of nasal potential difference measurements in human and mice, healthy or carrying two severe *CFTR* mutations

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Introduction: Nasal potential difference (NPD) test has long been used to assist in the diagnosis of CF and more recently as an outcome measure in clinical trials of new CF therapies. This test has also been adapted to the mouse nose.
Objectives: We aimed at evaluating variability of the NPD measurements in CF patients displaying two severe CFTR mutations and in sex-matched healthy controls. NPD recorded from F508del-CF and normal wild-type mice were also compared.
Methods: In each setting, tests were performed by a single qualified operator. In the clinical setting, the latest CFTT-TDN SOP was followed. A total of 80 tracings were obtained from 10 patients (23.2 y; range 14 to 32) and 10 healthy subjects (34 y; range 24 to 53), each tested twice, in both nostrils. Two CF and two controls were excluded from the statistical data analysis due to the presence of a single non interpretable NPD tracing (4/80, 5%). To achieve equal sample size, tests were obtained from 8 CF mice and normal wild-type. Comprehensive multivariate analysis of paired data showed a good reproducibility of NPD parameters in the clinical and the pre-clinical setting; lower variability was observed in mice. However, 95% repeatability limits of NPD parameters were large indicating a large measurement error, poor precision and low within-subject repeatability. In both settings, chloride secretion was shown to be the most reproducible and repeatable parameter.
Conclusion: In human as in mice, NPD showed good reproducibility but limited between-subject repeatability.

28 Earliest features of cystic fibrosis

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Objective: To assess the earliest CF-related signs and symptoms in participants of a newborn screening program.
Methods: On the scheduled date of sweat test and immediately before sweat sample collection, data on clinical history and physical examination were collected. CF diagnosis was confirmed by two sweat chloride measurements ($\geqslant$60 mEq/L). Cases with meconium ileus were excluded.
Results: 41 cases (24.1%) with a positive and 129 controls (75.9%) with a negative sweat test were included. Mean birth weight and mean age at the day of sweat test were 3,131 g and 3,276 g ($p = 0.04$), and 34.2 and 34.4 days old ($p = 0.88$) for cases and controls, respectively. Statistically significant differences were obtained from univariate analysis for weight gain lower than 300 g from birth up to the date of sweat test (22.0% vs. 6.2%, OR = 4.2, $p < 0.01$), salty taste of the skin (43.9% vs. 14.0%, OR = 4.7, $p < 0.001$), chest retractions (19.5% vs. 1.6%, OR = 14.9, $p < 0.001$), and voracious appetite (31.7% vs. 12.4%, 1.3, $p < 0.01$). After logistic regression, weight gain lower than 300 g (OR = 5.1, 95% CI, 1.6–15.6, $p < 0.01$), salty taste (OR = 4.4, 95% CI, 1.8–10.7, $p = 0.001$), and chest retractions (OR = 8.1, 95% CI, 1.4–44.9, $p = 0.01$) remaining as independent predictors of CF diagnosis.
Conclusions:
1. moderate-severe CF can be clinically suspected in the first weeks of life,
2. patients requiring treatment can be thus promptly identified and treated, and
3. in settings with or without newborn screening, children presenting the clinical findings described above must be referred to sweat test (among other lab exams) and/or offered a trial with pancreatic enzyme to confirm or to rule out CF.

29 Diagnostic capabilities of liver ultrasound elastography in the care of children with cystic fibrosis

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Objective: To determine the extent to which hepatic fibrosis is manifested in CF children using Liver Ultrasound Elastography (LUE).
LUE is viewed as one of promising techniques for a non-invasive diagnosis of a hepatic fibrosis stage in CF patients. There is, however, insufficient research data about application of this technique in pediatric patients at this point.
Methods: 45 children with CF aged 3 to 17 years (average age of 8.3±3.7 years) have been examined. All the children have been subjected to LUE using the FibroScan device (EchoSens, France). 14 (31.1%) out of the 45 children have been found to have abnormal median elasticity values ranging from 6.1 to 62.1 kPa. Of them, values obtained from 6 (42.9%) patients have indicated liver cirrhosis (F4), and 1 (7.1%) severe fibrosis (F3), 2 (14.3%) – moderate (F2), and 5 (35.7%) – mild fibrosis (F1). In addition, out of the 45 children, LUE results from 15 (33.3%) have varied widely: although all of them have shown normal median elasticity values, some measurements have revealed elevated values, thus putting the patients in the group at risk of developing diffuse liver fibrosis.
Conclusions: According to LUE, 31.1% of the children with CF have fibrotic changes in the liver. Of them, 50% have severe fibrosis and cirrhosis; Another 33.3% of the patients are at risk of developing hepatic fibrosis. LUE is an informative non-invasive method of staging hepatic fibrosis in CF children and can be applied repeatedly to assess the rate at which the condition is progressing.

30 Retinopathy in cystic fibrosis-related diabetes (CFRD) – patients' understanding and screening trends

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Background: Diabetic retinopathy (DR) is a serious potential complication of CFRD, and all such patients should undergo an annual screen for this, organized in the UK through the primary care national Retinopathy Screening (RS) program. However, some CFRD patients fail to attend for screening. We were interested to assess patients' understanding of DR, and the reasons for their non-attendance.
Method: Using a standardized questionnaire we asked 47 CFRD patients about their understanding of DR, the importance of RS (Likert-scale 1–5), and their compliance with screening.
Results: Eighty-one percent had heard about DR but only 45% admitted to formal counseling. Only 64% had attended RS in the previous year: of these, 13% had background changes and one patient (2%) had proliferative disease. Of those who did not attend, 65% said they were not asked, 24% either forgot or did not rate this an important appointment, and 12% had a recent CFRD diagnosis. Overall, 53% rated RS as very important (Likert-scale 5), 32% Likert-scale 3 or 4 and 15% were unsure.

Importance of RS perceived by patients

Likert scale	Proportion of patients
1 (Least important)	0
2	0
3	15%
4	17%
5 (very important)	53%
Don't know	15%

Conclusion: Our results show that a significant number of CFRD patients are either not aware or lack full understanding of DR, and many do not give RS enough importance and subsequently fail to attend. We are reinforcing our RS education program by providing literature at the CF annual screen and mailshots to CFRD patients. Direct registration of patients to the national RS program may also help improve the continuity of care.